from the shield structure 169. MTU manipulating structure 166 comprises a laterally extending plate 168 extending from shield structure 169 with a vertically extending piece 167 on the opposite end of the plate 168. A gusset wall 165 extends downwardly from lateral plate 168 between shield structure 169 and vertical piece 167.

As shown in FIGURE 60 the shield structure 169 and vertical piece 167 have mutually facing convex surfaces. The MTU 160 is engaged by the transport mechanisms 500, 502 and other components, as will be described below, by moving an engaging member laterally (in the direction "A") into the space between the shield structure 169 and the vertical piece 167. The convex surfaces of the shield structure 169 and vertical piece 167 provide for wider points of entry for an engaging member undergoing a lateral relative motion into the space. The convex surfaces of the vertical piece 167 and shield structure 169 include raised portions 171, 172, respectively, formed at central portions thereof. The purpose of portions 171, 172 will be described below.

A label-receiving structure 174 having a flat label-receiving surface 175 is provided on an end of the MTU 160 opposite the shield structure 169 and MTU manipulating structure 166. Labels, such as scannable bar codes, can be placed on the surface 175 to provide identifying and instructional information on the MTU 160.

The MTU 160 preferably includes tiplet holding structures 176 adjacent the open mouth of each respective receptacle vessel 162. Each tiplet holding structure 176 provides a cylindrical orifice within which is received a contact-limiting tiplet 170. The construction and function of the tiplet 170 will be described below. Each holding structure 176 is constructed and arranged to frictionally receive a tiplet 170 in a manner that prevents the tiplet 170 from falling out of the holding structure 176 when the MTU 160 is inverted, but permits the tiplet 170 to be removed from the holding structure 176 when engaged by a pipette.

As shown in Figure 59, the tiplet 170 comprises a generally cylindrical structure having a peripheral rim flange 177 and an upper collar 178 of generally larger diameter than a lower portion 179 of the tiplet 170. The tiplet 170 is preferably formed from conductive polypropylene. When the tiplet 170 is inserted into an orifice of a holding structure 176, the flange 177 contacts the top of structure 176 and the collar 178 provides a snug but releasable interference fit between the tiplet 170 and the holding structure 176.

An axially extending through-hole 180 passes through the tiplet. Hole 180 includes an outwardly flared end 181 at the top of the tiplet 170 which facilitates insertion of a pipette

tubular probe (not shown) into the tiplet 170. Two annular ridges 183 line the inner wall of hole 180. Ridges 183 provide an interference friction fit between the tiplet 170 and a tubular probe inserted into the tiplet 170.

The bottom end of the tiplet 170 preferably includes a beveled portion 182. When tiplet 170 is used on the end of an aspirator that is inserted to the bottom of a reaction receptacle, such as a receptacle vessel 162 of an MTU 160, the beveled portion 182 prevents a vacuum from forming between the end of the tiplet 170 and the bottom of the reaction receptacle vessel.

LOWER CHASSIS

An embodiment of the lower chassis of the present invention is shown in FIGURES 52-54. The lower chassis 1100 includes a steel frame 1101 with a black polyurethane powder coat, a pull-out drip tray 1102 disposed below the chassis, a right-side drawer 1104, and a left-side drawer 1106. The left-side drawer 1106 is actually centrally disposed within the lower chassis 1100. The far left-side of the lower chassis 1100 houses various power supply system components and other analyzer mechanisms such as, for example, seven syringe pumps 1152 mounted on a mounting platform 1154, a vacuum pump 1162 preferably mounted on the floor of the lower chassis 1100 on vibration isolators (not shown), a power supply unit 1156, a power filter 1158, and fans 1160.

A different syringe pump 1152 is designated for each of the five magnetic separation wash stations 800, one is designated for the left-side orbital mixer 552, and one is designated for the deactivation queue 750. Although syringe pumps are preferred, peristaltic pumps may be used as an alternative.

The vacuum pump 1162 services each of the magnetic separation wash stations 800 and the deactivation queue 750. The preferred rating of the vacuum pump is 5.3-6.5 cfm at 0" Hg and 4.2-5.2 cfm at 5" Hg. A preferred vacuum pump is available from Thomas Industries, Inc. of Sheboygan, Wisconsin, as model number 2750CGHI60. A capacitor 1172 is sold in conjunction with the pump 1162.

The power supply unit 1156 is preferably an ASTEC, model number VS1-B5-B7-03, available from ASTEC America, Inc., of Carlsbad, California. Power supply unit 1156 accepts 220 volts ranging from 50-60 Hz, i.e., power from a typical 220 volt wall outlet. Power filter 1158 is preferably a Corcom model 20MV1 filter, available from Corcom, Inc. of Libertyville, Illinois. Fans 1160 are preferably Whisper XLDC fans available from Comair Rotron, of San

Ysidro, California. Each fan is powered by a 24VDC motor and has a 75 cfm output. As shown in FIGURE 52, the fans 1160 are preferably disposed proximate a left-side outer wall of the lower chassis 1100. The fans 1160 are preferably directed outwardly to draw air through the lower chassis from the right-side thereof to the left-side thereof, and thus, to draw excess heat out of the lower chassis.

Other power supply system components are housed in the back left-hand side of the lower chassis 1100, including a power switch 1174, preferably an Eaton circuit breaker switch 2-pole, series JA/S, available from the Cutler-Hammer Division of Eaton Corporation of Cleveland, Ohio, and a power inlet module 1176 at which a power cord (not shown) for connecting the analyzer 50 to an external power source is connected. The power supply system of the analyzer 50 also includes a terminal block (not shown), for attaching thereto a plurality of electrical terminals, a solid state switch (not shown), which is preferably a Crydom Series 1, model number D2425, available from Cal Switch, Carson City, California, for switching between different circuits, and an RS232 9-pin connector port for connecting the analyzer 50 to the external computer controller 1000.

The right-side drawer and left-side drawer bays are preferably closed behind one or two doors (not shown) in front of the analyzer, which is/are preferably locked by the assay manager program during operation of the analyzer. Microswitches are preferably provided to verify door-closed status. The far left bay is covered by a front panel. End panels are provided on opposite ends of the lower chassis to enclose the chassis.

Four leveler feet 1180 extend down from the four corners of the chassis 1100. The leveler feet 1180 include threaded shafts with pads at the lower ends thereof. When the analyzer is in a desired location, the feet 1180 can be lowered until the pads engage the floor to level and stabilize the analyzer. The feet can also be raised to permit the analyzer to be moved on its casters.

Bulk fluids typically contained in the containers of the lower chassis 1100 may include wash buffer (for washing immobilized target), distilled water (for washing fixed pipette tips), diagnostic testing reagents, silicon oil (used as a floating fluid for layering over test reagents and specimen), and a bleach-based reagent (used for sample deactivation).

The right-side drawer 1104 is shown in detail in FIGURE 53. The right-side drawer 1104 includes a box-like drawer structure with a front drawer handle 1105. Although drawer handle 1105 is shown as a conventional pull-type drawer handle, in the preferred embodiment of